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PATENT SPECIFICATION

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COMPLETE SPECIFICATION

Improvements in or relating to Single Seed Sowing Machines

I, WILHELM VOGELPOHL, a German Citizen, of 211, Gchlenbeck, Krs. Luebbeke in Westfalia, Germany, do hereby declare the invention, for which I pray that a patent may be granted to me, and the method by which it is to be performed, to be particularly described in and by the following statement:—

The present invention concerns improvements in single seed sowing machines.

- 10 The problem of drilling or sowing individual seeds at predetermined intervals has existed for decades in agriculture, particularly in the cultivation of sugar beet and fodder root crops. This problem has never
15 hitherto been satisfactorily solved. Known machines for sowing single seeds are either very complicated and expensive or have many deficiencies, with the result that they have never become appreciably popular in
20 practice.

For example, in known single seed sowing machines, separation of the seeds is effected by a drum-like rotor which is provided in its curved surface with holes at equally spaced
25 intervals, the interior of the rotor being operatively connected to an air suction pipe with the exception of one part which is in the range of an air current which serves to blow seeds, which adhere to the drum under the
30 influence of the suction, into a drill share or the like. A disadvantage of this construction resides in the fact that it is not certain that a seed will adhere to every hole of the rotor. Furthermore, the sucking-up of several seeds
35 by a single suction hole cannot be prevented.

This type of sowing machine, which has been known for decades, is still used almost exclusively on farms for sowing sugar beet seeds and fodder root crops even today, and
40 consequently it is not possible to sow the individual seeds at predetermined intervals, with the result that the small plants must still be separated in the rows by hoeing and re-
45 moving, which is much more expensive than operation

[Price 3s. 6d.]

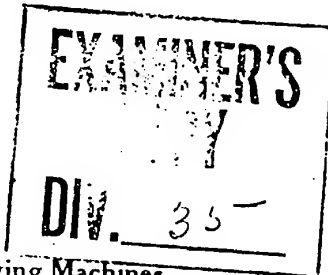
According to the present invention there is provided a single seed sowing machine comprising a disc rotatably arranged on a horizontal axis adjacent a seed container and having a row of circumferential suction openings or cells into which individual seeds are sucked from the container, rotation of the disc causing the seeds to be carried in their respective openings or cells to be moved successively into the range of a current of compressed air which blows the seeds, in turn, into a furrow forming share or the like, characterised by the provision of a blowing head which is directed towards that side of the disc which confronts the seed container, which blowing head serves to supply a current of air to the disc so as to remove any excess seeds which may be carried thereby.

Preferably the disc has, at its outer periphery, a marginal beading which engages in the annular recess of the flange, the space defined by the disc, the flange and the beading being connected to an outwardly directed mouthpiece of a compressed air conduit which supplies the current of compressed air to blow the seeds, through a radial slot in the flange and a discharge pipe connected thereto, to the drill share or the like.

The disc is preferably driven by means of a chain drive from a trailing wheel which moves over the soil, and which wheel also supports a housing of the machine which housing has a drill share secured to its underside.

The aforementioned construction of a drilling or sowing machine renders possible for the first time a reliable and uniform expulsion of individual seeds. In the drilling of so-called monogerm seeds (seeds which germinate only once) the laborious withdrawal of the plants by hand is avoided thereby saving a considerable amount of working time. By changing the transmission between
50 between the individual seeds may be adjusted as desired. By exchanging the disc for

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another disc, seeds of different granular size may also be sown with the same machine.

The invention will be described further, by way of example, with reference to the accompanying drawings, in which:—

Fig. 1 is a side view of a single seed sowing machine;

Fig. 2 is a corresponding plan;

Fig. 3 is a cross-section on the line A--B of Fig. 1;

Fig. 4 is a fragmentary elevation (marginal portion) of the cell disc at the point where the seed is expelled;

Fig. 5 is a section on the line C--D of Fig. 4;

Fig. 6 is an interior view of the part of the housing containing the seed container;

Fig. 7 is an interior view and part section of the housing portion having the suction and pressure pipe line connection;

Fig. 8 is the portion of the housing shown in Fig. 7 having a cell disc mounted therein.

A housing of a seed drilling machine consists of two cylindrical parts 1 and 2 of differing diameters the open ends of which are in juxtaposition. A bush 3, mounted in the centre of the housing part 1, has an axle 4 mounted therein. The axle 4 carries a chain 5 at one end, outside the housing 1, and a disc 6 on its other end. Recesses or cells 7, provided on the periphery of the disc 6, are equally spaced from one another; the cells are flared outwardly in funnel form and are so dimensioned that they are each adapted to receive one seed. The periphery of the cell disc 6 is disposed adjacent a flange 8, secured to the housing 1, and has on its side facing the flange 8, a marginal beading or bevel 9 engaging in an annular recess 10 of the flange 8.

The construction of the cell disc 6 and of the flange 8 results in the provision of a space 11 defined by the disc 6, flange 8 and beading 9 for the passage of air which is sucked off by a pipe line 12 from a suction connection of a blower (not shown) from the housing 1. A baffle plate 13 serves to cause approximately one half of the periphery of the disc 6 to be subjected to an intense suction effect.

A seed storage hopper 15 is supported on the outside of the housing 2, which latter contains the seeds to be sown. An aperture 16, through which the seeds can pass into the housing 2 (which constitutes a seed container), is provided in the lower part of the storage hopper 15 and/or in the wall of the housing 2. This aperture 16 is made just large enough for as many seeds to trickle into the housing 2 as can be conveyed by the cell disc 6.

To avoid seed blockages, a stirring finger 17, arranged near the aperture 16, is located on the end of a lever 18, which is adapted to swing about a pivot 19 mounted on the housing 2 and under the action of a

tension spring 20 which urges it constantly against an axle 21 of the cell disc 6. A cam 22, carried by the axle 21 near the lever 18, is adapted to strike against the lever 18 once during each rotation of the cell disc 6 and, in co-operation with the spring 20, this causes the stirring member 17 to reciprocate in the aperture 16. In this manner the seeds are continuously fed to the interior of the housing 2 in small quantities so that they cannot be squashed or otherwise damaged by the turning movement of the cell disc 6, and are sucked into the cells 7.

A blast or compressed air pipe 23 is connected to the housing 1; the end of the pipe 23 is connected to a pipe 24, of very small cross section, which extends into the lower portion of the housing 1 and carries a mouthpiece 25 on its end, which mouthpiece is provided with a tapering finger 40 and is disposed directly behind the edge of the cell disc 6, i.e. in the vicinity of the cells 7. The edge of the flange 8 adjoining the periphery of the disc 6 has a radial slot 26 and a finger 27 which latter is arranged flat against the side of the periphery of the disc remote from the mouthpiece 25.

A discharge pipe 28, connected to the outlet of the mouthpiece 25, extends as far as the housing 1, forming a wing plough share 29 mounted under the housing 1; the upper end of the pipe 28 is cut off at an angle so as to terminate approximately in line with the mouthpiece 25 but at that side of the cell disc 6 remote from the mouthpiece. This arrangement makes it possible for seeds in the cells 7 to be expelled from their cells when the latter come within the range of the mouthpiece 25 by the compressed air flow from the latter and to be deflected by the fingers 27 and 40 and to be directed downwardly so that the seeds must necessarily pass through the slot 26 and reach the discharge tube 28 which conveys them directly to the plough share 29. The compressed air escapes to atmosphere through an opening 30 provided in the housing 2.

An excess seed removing device, in the form of a blast nozzle 31, is arranged near the cell disc 6, preferably in the upper part of the housing 1. This blast nozzle 31 is directed onto that surface of the disc 6 which confronts the seed container and blows any excess seeds which may cling to such disc surface back into the seed container. The seeds entering the cells 7, of course, are unaffected, since they are subjected to the intense suction in the region of the baffle plate 13, and seeds already in their cells are retained therein by the flange 8.

The nozzle 31 is connected, by means of a branch pipe 32, to the compressed air pipe 23 and is so constructed that the escaping air current flows along the side of the disc facing the housing 2 and thus catches any excess

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seeds clinging to the outside of the cells, which seeds thus drop back into the lower portion of the housing 2. It is particularly advantageous to construct the nozzle 31 in such manner that the blast air current is subdivided whereby flows are directed in different directions as indicated by the arrows in Fig. 8.

A segment-shaped sheet metal hollow body 33, open at the front, is mounted inside the housing 2 so as to mask the cells 7 in that portion of the periphery of the disc 6 which is disposed between the blast nozzle 31 and the mouthpiece 25 from the seeds entering housing 2. The sheet metal body 33 prevents any seeds which may be entrained by the suction air current from passing onto the cell disc 6 or clinging onto an already occupied cell 7 in the region of the disc between the blowing head 31 and the radial slot 26.

The cell disc drive is derived from a trailing wheel 34 moving over the soil, which wheel is mounted on one end of a beam 35 and is coupled by way of a chain wheel 36 and chain 37 to the chain wheel 5 which is secured to the axle 4 of the cell disc 6. The beam 35 is supported, relative to the housing 1, by an adjusting spindle 38 which enables a very accurate adjustment of the beam 35 about the axis of the disc 6 and of the depth of engagement of the drilling plough share 29.

If the space between the individual seeds is to be reduced or enlarged, the chain wheel 5 is replaced by a chain wheel of smaller or larger diameter as required; this is readily possible, without difficulty, after loosening of a thumb screw 39 which is adapted to hold the wheel 5 in position.

The seed sowing machine shown in these figures is particularly intended for the sowing out or drilling of sugar beet seeds or fodder root crop seeds. These seeds are of approximately the same size so that normally one cell disc will suffice. It is also possible to use this machine for any other seed size, in which case the cell disc 6 is replaced by a cell disc having correspondingly smaller or larger cells. With suitable dimensions the machine may also be adapted to be used as a potato planting machine, or the like.

When preparing rather large areas, a plurality of sowing machines of the above-described type may be coupled to a tractor or horse-drawn vehicle. In order to produce the necessary suction and compressed air, a comparatively small and simple blower, directly mounted on any tractor, will suffice.

WHAT I CLAIM IS:-

1. A single seed sowing machine comprising a disc rotatably arranged on a horizontal axis adjacent a seed container and having a row of circumferential suction openings or

cells into which individual seeds are sucked from the container rotation of the disc causing the seeds to be carried in their respective openings or cells to be moved successively into the range of a current of compressed air which blows the seeds, in turn, into a furrow forming share or the like, characterised by the provision of a blowing head which is directed towards that side of the disc which confronts the seed container, which blowing head serves to supply a current of air to the disc so as to remove any excess seeds which may be carried thereby.

2. A sowing machine as claimed in Claim 1 wherein the blowing head is adapted to provide a subdivided current of air directed in different directions.

3. A sowing machine as claimed in Claim 1 or 2 wherein the disc is rotatable within an annular recess provided in an adjacent flange, the cells in the disc being equally spaced and flared outwardly in funnel form.

4. A sowing machine as claimed in Claim 3 wherein the disc has, at its outer periphery, a marginal heading which engages in the annular recess of the flange, the space defined by the disc, the flange and the heading being connected to an outwardly directed mouthpiece of a compressed air container which supplies the current of compressed air to blow the seeds, through a radial slot in the flange and a discharge pipe connected thereto, to the drill share or the like.

5. A sowing machine as claimed in Claim 4 wherein fingers are provided at either side of the disc, in the region of the mouthpiece, to deflect the seeds into the radial slot.

6. A sowing machine as claimed in Claim 4 or 5 wherein the seed container is provided with a hollow sheet metal segment shaped body which masks the cells on that part of the disc periphery between the blowing head and the radial slot.

7. A sowing machine as claimed in any preceding claim characterised in that it comprises a housing which has a furrow forming share attached to its underside.

8. A sowing machine as claimed in Claim 7 wherein the disc is adapted to be driven, by chain means, from a ground-engaging trailing wheel of the device, which trailing wheel is mounted upon a beam which is adjustable about the axis of rotation of the disc.

9. A sowing machine as claimed in Claim 8 wherein the beam is supported relative to the housing, by an adjusting spindle.

10. A single seed sowing machine substantially as hereinbefore described with reference to and as illustrated in the accompanying drawings.

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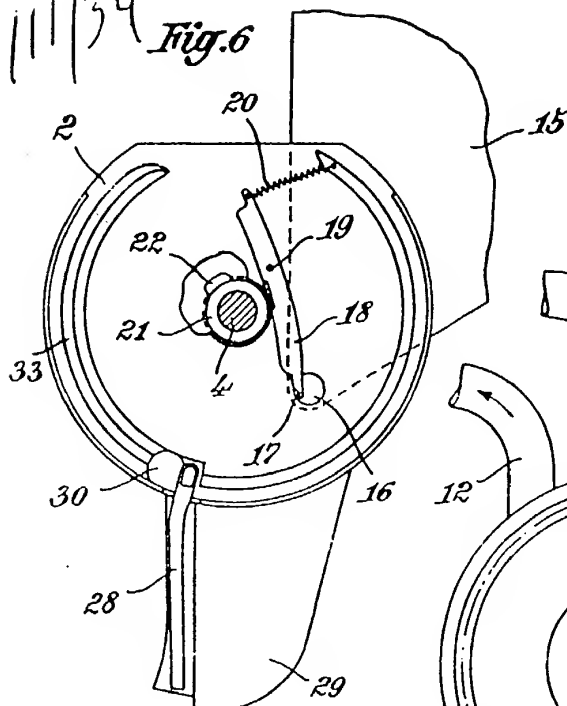
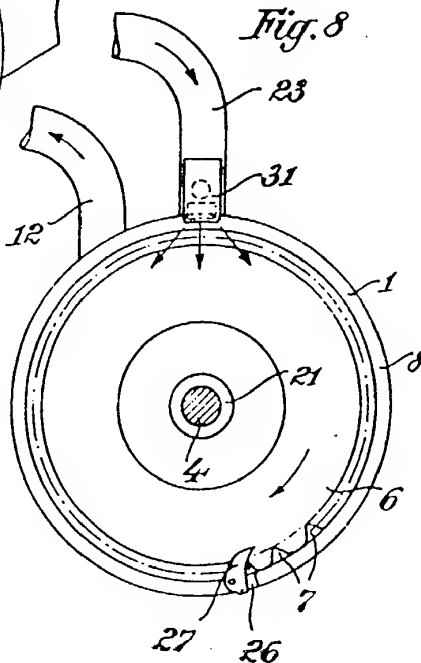
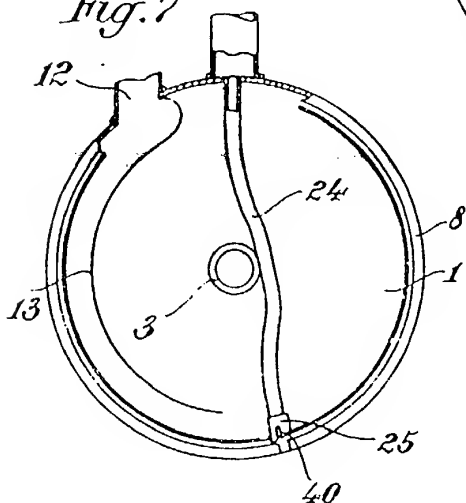
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3 SHEETS

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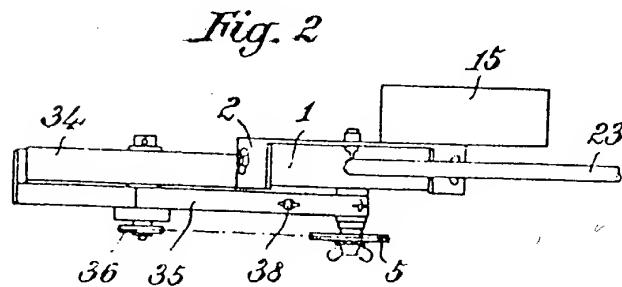
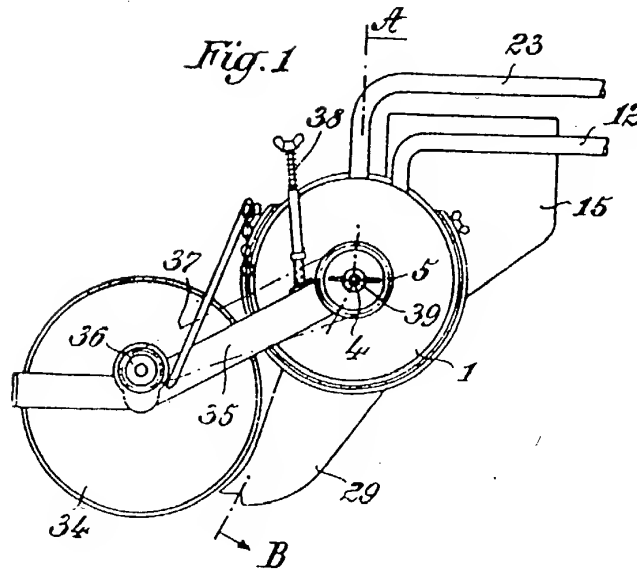
SHEETS 2 & 3

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Fig. 6*Fig. 8**Fig. 7*

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 SHEET 1



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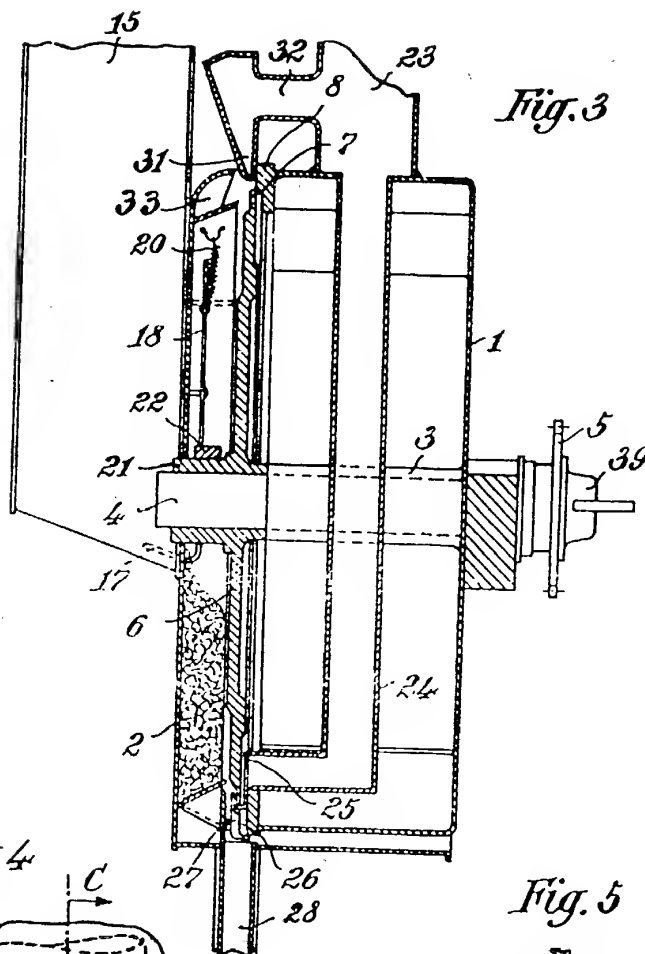


Fig. 3

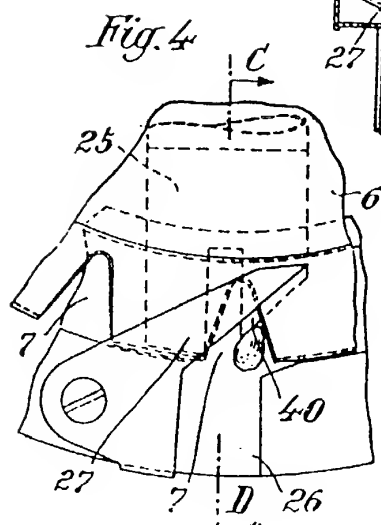


Fig. 4

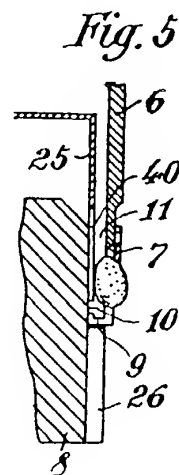


Fig. 5

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